the mucosa, and sometimes the muscular layer. It seemed, in fine, proven that the contraction of the wall of the stomach in the pyloric region was soon followed by necrosis of the mucosa, and this by the development of an ulcer. The pressure upon the bloodvessels, and especially upon the arteries, must come into play here, for, if the movement of the blood in the veins were disturbed more than that in the arteries, hæmorrhages would be found in various portions. The occurrence of hæmorrhages shows, however, that the veins do not entirely escape the pressure of the muscular layer. The great likeness between the symptoms after which, and the place where, ulcer of the stomach appears in both the rabbits experimented on and in man, justifies the conclusion that the genesis of both is the same; and that ulceration and hæmorrhage occurring in men after gastric spasm are the result of arterial anæmia produced by the pressure of the contracting muscular layer of the stomach. When hypersecretion of hydrochloric acid and gastric spasm occur together the conditions are those most fitting for the production of ulcer. The author believes that an excess of hydrochloric acid is often the cause of gastric spasm; but that it is not always the cause is shown by the fact that the administration of large amounts of fluid with carbonate of soda does not always prevent the attacks, and sometimes even seems to increase them. Nor does he claim that every case of ulcer is due to gastric spasm, though very many instances can be explained in no other way. That the ulcers occur almost always in the pyloric region is due to the fact that the muscular contraction is strongest here. When the contraction of the walls of the fundus is unusually strong, ulcers may occur there also.

The condition of the ulcers after once formed is still an undecided question. It has generally been claimed that they showed no tendency to heal, and that they may last for even twenty years or more. The author is, however, inclined to the view that the instances of vomiting of blood after long intervals of freedom from it are simply instances of the formation of new ulcers under the influences of the old causes, the old ulcers having healed. He thinks it improbable, if not impossible, that the functions of the stomach could continue normal between the attacks, if the ulcer were still existing.

SURGERY.

UNDER THE CHARGE OF

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GLUCK'S METHOD OF INSERTING IVORY JOINTS AS A SUBSTITUTE FOR EXCISED ONES.

DR. GLUCK'S claim (*British Medical Journal*, No. 1550) to be able to implant pieces of bone and even whole joints, has naturally excited not only attention but also much sceptical criticism. We saw, at the recent Berlin Congress, his articulated skeleton with bones patched with ivory and articulations replaced by an ingenious joint of the same material; but it was generally regarded as a curiosity rather than as of practical surgical interest. When a patient was shown, however, with a knee-joint capable of motion through a range of forty-five degrees, more interest was manifested, and Prof. Gluck's explanation of his methods was listened to with marked respect. He uses perforated spindle-shaped plugs of ivory, both ends imbedded in the central portions of the bones which it is proposed to unite. A modification of the method enables him to insert the false joint in suitable cases. There can be no doubt of his ability to secure at least temporary union of the soft parts over these ivory plugs, but the ultimate fate of the latter is more problematical. The possibilities are summed up as follows:

1. They may possibly remain there imbedded in the tissues, and, like pieces of metal, bullets, etc., give rise to no further trouble. Should such be the case with a joint, it is clear that, even if the patient walked well at first, owing to the plugs being sufficiently firmly united to the living bone to permit of it, the joint must after a while wear out, become broken and require to be repaired, thus necessitating a second operation. It is, however, extremely unlikely that any such result would occur. Pathology and practical experience have both taught us that bone or ivory, when it is employed for the union of bony parts, only plays a temporary part in their restoration, and is, after a time, longer or shorter as the case may be, completely absorbed. Gluck's own case, just mentioned, shows how rapidly such absorption can take place; in fourteen weeks after he had completed his operation on the humerus the bone which was extracted was much eroded all over its surface. If a joint is to be inserted which would be capable of performing its functions for any length of time, it must be constructed of metal or of some material which will resist those powers of absorption which are the property of all animal tissues.

2. These introduced pieces of ivory may prove a source of so much irritation that the animal tissues will not erode them, and they will then speedily become loosened from their surroundings and form a sequestrum, which if not removed will only remain as a source of irritation, and will, after some slight injury, give rise to suppuration and make its own exit *nolens volens.* This is practically what would have happened in Gluck's myeloid sarcoma of the humerus case had the ivory plug not been removed by the Professor as soon as it had ceased to be fixed to the surrounding tissues.

3. The irritation of the foreign body will set up an overgrowth of bone in the neighborhood, and thus a joint which is at first movable will, provided much periosteum remains near it, be slowly enveloped in new bone-formation, and have its power of movement gradually checked and eventually brought to a complete standstill by the masses of bone which, advancing from both of the long bones to which it is attached, will at length produce a stiff joint and inclose the ivory apparatus. Complete absorption or necrosis of the ivory joint will then only be a matter of time.

Thus it would seem that surgery can hope for but little aid in this plan of treatment, except in so far as it aids us in promoting the union of bones, or in preserving temporarily the length of a limb of which considerable portions of bone have been destroyed, thus giving time for the periosteum that remains to supply a new bone equal in dimensions to the one that has been removed.

We shall await with interest the future history of the cases on which Gluck has tried his ingenious plan of bone-implantation, and we shall indeed be surprised if any useful improvement remains three years after the insertion of their ivory joints.

THE TREATMENT OF TUBERCULAR ARTHRITIS AND ABSCESSES BY IODOFORM INJECTIONS.

Since, according to BRUNS (*Arch. für klin. Chirurg.*, Bd. xl. Heft 4), the antitubercular power of iodoform is established beyond all cavil, the treatment of cold abscesses and white swellings by this drug should, when the latter is brought in direct contact with the diseased foci, yield satisfactory results. It is true that the treatment of open ulcers by iodoform applications has been disappointing, but this is readily explained by the fact that the constant secretion washes away the medication. When the diseased granulations are thoroughly removed by curetting or the use of the knife, there are few who will not grant that the free use of iodoform has a very positive and powerful action in preventing recidivity. In cold abscesses the most favorable conditions are offered for the action of an antitubercular medicament. There is here a closed cavity with walls made up of tubercular granulations and encapsulated from the surrounding healthy tissues by a fibrous investment. Iodoform injected into this cavity is brought intimately in relation with all parts of its lining membranes and remains in close contact for weeks. The effects of this treatment are rarely manifested for weeks or even months, then the abscess gradually diminishes in size, and finally disappears entirely. The length of time required to accomplish cure is frequently a cause of failure, since the surgeon, losing faith in this treatment, is prone to abandon it for some other before it has been fairly tried. In large abscesses a decided diminution in size can rarely be expected before one or two months, and complete cure is most exceptional before two to four months. The ultimate result is, however, so well assured that a favorable prognosis can be confidently made even when the patient is compelled to be up and about. In the last five years Bruns has treated upward of a hundred cold abscesses by means of iodoform injection, and 80 per cent. have been cured. This result is in strict accord with the reports of Billroth and Verneuil, and the combined cases are so numerous as to constitute an absolute proof as to the antitubercular power of iodoform. Olive oil was used as an excipient, the drug being added in the proportion of one to ten. Since it has been claimed that recidivity is common after apparent cure by this method, the cases treated two or three years ago were again examined; in all the cure was lasting.

Results such as these would strongly commend the treatment of tubercular empyema in the same manner. The author has had but slight opportunity of testing the treatment; in one case, however, the pleural exudate was in several months diminished one-third, while the body-weight was increased one-fourth.